

MONTHLY WEATHER REVIEW,

MAY, 1879.

(General Weather Service of the United States.)

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

In compiling the present REVIEW the following data, received up to June 14th, have been made use of, viz: the regular tri-daily weather charts, containing the data of simultaneous observations taken at 122 Signal Service stations and 12 Canadian stations, as telegraphed to this office; monthly journals and means, 131 and 149 respectively, from the former, and monthly means from 13 of the latter; reports from 28 special Sunset stations; 225 monthly registers from Voluntary Observers; 49 monthly registers from United States Army Post Surgeons; Marine Records; International Simultaneous Observations; monthly reports from Voluntary Observers in, and the local Weather Services of, the States of Iowa and Missouri; reliable newspaper extracts; special reports.

BAROMETRIC PRESSURE.

Upon chart No. II is shown by the isobaric lines the general distribution of atmospheric pressure, as reduced to sea-level, for the month. Compared with the means for May of previous years, the mean pressure for the present month is higher in all the districts, except Florida, from southern Alabama to Texas, in the Missouri valley from Yankton to Leavenworth, and at Salt Lake City and Portland, Or.; but in these districts it agrees with the average or is very slightly below, the greatest deficiency (0.03 inch) occurring at Punta Rassa. The regions of greatest excess are in the Northwest (Bismarck 0.26 above,) in California, (Sacramento 0.14 above,) and over New England, the Middle Atlantic States and Lower Lakes, (Mt. Washington 0.14 and Albany 0.12.) In the remaining districts it ranges above the average as follows: South Atlantic States, 0.08 at Cape Hatteras to 0.00 at Jacksonville; Ohio valley and Tennessee, 0.09 at Pittsburgh to 0.02 at Memphis; Upper Lakes, 0.10 at Escanaba to 0.05 at Milwaukee; Upper Mississippi valley and Minnesota, 0.10 at Pembina to 0.02 at Keokuk; Rocky Mountain stations, 0.09 at Santa Fé to 0.01 at Virginia City. In the following description of areas of high and low pressure, the barometer readings when given are as reduced to sea level, but the deviations from normal relate to pressures not reduced.

The Local Barometric Ranges have been comparatively small, and have varied as follows: California, 0.37 at San Diego and San Francisco to 0.57 at Red Bluff; Western Plateau, 0.36 at Pioche to 0.62 at Boise City; Rocky Mountains, 0.32 at La Mesilla, N. M., to 0.78 at Virginia City; Gulf States, 0.25 at Key West and 0.40 at Galveston to 0.59 at Graham, Tex., and 0.60 at Montgomery; Atlantic States, 0.55 at Jacksonville to 0.64 at Norfolk, 0.83 at Wood's Holl and 1.00 at Eastport, and in interior, 0.64 at Augusta to 0.74 at Lynchburg and 0.93 at Albany; Ohio valley and Tennessee, 0.52 at Memphis to 0.82 at Pittsburgh; Lake region, 0.88 at Cleveland to 1.19 at Duluth; the Northwest and Eastern Slope of Rocky Mountains, 0.79 at St. Louis to 1.33 at Breckenridge, 0.87 at Leavenworth to 1.11 at Yankton and 0.94 at Bismarck, 0.99 at Dodge City, 1.05 at North Platte and 0.79 at Deadwood.

Areas of High Barometer.—Nine are described below. The average directions of the paths of highest pressure is from the Pacific coast, between latitudes 38° and 45° northeastward to Manitoba and thence east-southeastward to the Atlantic coast.

No. I—was central on the morning of the 18th over Minnesota, and moved southeastward over the eastern section of the country during the 2nd and 3rd. It produced the lowest temperatures of the month in the Lake region, Ohio valley, Gulf and Atlantic States, and killing frosts in the low lands of some of the Southern States. The following minimum temperatures were observed: on the 1st, at Port Huron, 27°; Oswego, 30°; on the 2nd, Pittsburgh, 33°; Knoxville, 38°; on the 3rd, Montgomery, 50°; Atlanta, 49°; Augusta, 48°; Charlotte and Kittyhawk, 45°; Washington and Albany, 36°.

No. II—appeared on the 2nd on the Pacific coast in rear and to the southwest of low pressure area No. II; 4:35 p. m. barometer at Red Bluff 30.23, or 0.32 above the normal; fresh to high northwesterly winds, rapidly falling temperature and clear weather extended eastward to Utah. Maximum velocities: at Winnemucca, W. 46; Salt Lake City, NW. 48; Umatilla, SW. 48 miles. 3rd, was central over the Western Plateau; pressure at 7:35 a. m. (Washington time) 0.20 above normal at Umatilla, Boise City and Salt Lake; minimum temperatures, 23° at Winnemucca, 30° at Boise City, 32° at Pioche and 25° at Virginia City, Mo. 4th, central over Montana, with diminished pressure; minimum temperature at Virginia City, 28°; summit of Pike's Peak, 10°. 5th, central over Dakota, with increasing pressure, and preceded by north to west winds and falling temperature to the Ohio valley and Lower Lakes. 6th, central over Manitoba, with increased pressure; the lowest temperatures of the month occurred in the Upper Mississippi valley, with heavy frosts, and cooler northwesterly winds extended over the Middle States. 7th to 9th, moved slowly eastward over the Lake region, with heavy frosts, and New England; light to fresh north winds veering to easterly and clear weather prevailed east of the Rocky Mountains, except over the Northwest, where southerly winds and light rains preceded low areas Nos. IV and V, and along the South Atlantic States, where fresh to high northeast winds and cloudy or rainy weather generally prevailed. Cautionary Signals (late) ordered on the North Carolina coast morning of the 7th were justified: Cape Lookout, NE. 40 miles. Cautionary Signals (late) ordered on the North Carolina coast on the morning of the 8th and continued to the afternoon of the 11th were fully justified: Cape Lookout, NE. 40 miles; Kittyhawk, NE. 45. On the 11th there was probably an area of low pressure east of Florida; at Punta Rassa the wind rose to NW. 42. 10th to 14th, the highest pressure continued off the southern New England and Middle Atlantic coasts, with continued northeasterly winds, cloudy and rainy weather in the South Atlantic States; east to southerly winds, clear or fair weather and rising temperature in the Middle States and New England.

No. III—appeared on the coast of California on the 6th in rear and to the southwest of low area No. IV, and passed northwards on the 7th, followed during the night and morning of the 6th and 7th by cold northerly winds from California to Idaho; during the prevalence of which heavy frosts occurred doing considerable damage in the low valleys of central and northern California; in the Honey Lake valley, Cal. and Nevada, "the prospects for a good fruit crop were completely destroyed."

No. IV—appeared on the Pacific coast on the 9th and remained almost stationary until the 11th, with generally cool, clear weather west of the Rocky Mountains, except occasional very light rains in Oregon, Washington Ty. and southern portion of Nevada. 12th, it spread eastward, in rear of low area No. X, preceded by diminishing brisk to high northerly winds and clearing weather in eastern Wyoming and Colorado, and followed by rising temperature over the Western Plateau and interior of the Coast States. 13th, was central over Montana, with clearing weather over the extreme Northwest. 14th, central over the Northwest with diminished pressure. 15th and 16th, moved eastward over the Lake region with clear, pleasant weather; heavy frost was reported in La Crosse Co., Wis.

No. V—appeared on the coast of California on the 14th as low area No. VI moved eastward into Utah and Montana. 15th, moved northeast to Idaho, preceded by brisk to high westerly winds and clearing weather. 16th and morning of the 17th was central over Idaho and Montana, with low temperatures and frosts in the Upper Missouri valley. 17th and 18th passed rapidly eastward north of the Lake region and St. Lawrence valley, with clear or fair weather in these districts. Brisk to high northerly winds prevailed for a short time on the 17th on Lake Superior and Cautionary Signals were ordered for Lake Michigan and Port Huron, but were not justified.

No. VI—appeared over the Northwest on the 20th in rear of low area No. VIII and moved slowly eastward to the Gulf of St. Lawrence by the 23rd. During these days clear or fair weather and northerly, veering to easterly, winds generally prevailed east of the Rocky Mountains, with frosts in the Lake region, New England and Middle States, while low area No. X approached the Northwest from the Pacific. 24th, it moved southward over the Atlantic States, with winds veering from east to south in the Atlantic and Gulf States as low area No. X moved eastward over the Lake region; at Cape May the minimum temperature was 47°, but ice was reported within five miles of station; frosts occurred southward to Virginia.

No. VII.—On the 2nd a general rise in pressure occurred on the Pacific coast, in rear of low area No. X. 23rd, the pressure fell over California but rose to the northward and over the Western Plateau. 24th and 25th, highest pressure was over Idaho, Montana and Wyoming. 26th, over the Northwest. 27th and 28th, over the Mississippi valley and Lake region. 29th and 30th, off the Atlantic coast, followed by southerly winds and rising temperature.

No. VIII—appeared north of Lake Superior on the 25th. 26th, moved southeastward over the Lake region and Middle States; lowest temperature of month, 13°, on summit of Mt. Washington. 27th, moved southward off the Atlantic coast and joined area No. VII; on this day the maximum velocity of the month, NW. 133 miles, occurred on summit of Mt. Washington.

No. IX.—As low area No. XIII moved northward on the 28th the pressure rose over southern California, reaching the maximum (30.26 or 0.30 above normal) at San Diego at 4:35 p. m. (Washington time); snow fell on the Sierra Nevadas and "the snow line extended well down to the foot hills on the Nevada side. 29th, the highest pressure was transferred to Oregon; maximum (30.34) at Portland at 11 p. m. 30th, it moved eastward and on the 31st was central over Montana and Dakota; barometers, at 11 p. m., at Virginia City and Bismarck, 30.04 or 0.37 and 30.38 or 0.45 above normals, respectfully.

Area of Low Barometer.—Fifteen have been sufficiently well marked to merit a brief description, and upon chart No. II will be found the tracks of the centres of fourteen. The general direction of the most important has been easterly.

No. I.—is a continuation of low areas No. XVI and XVII, described in the *April Review*. 1st, it moved slowly northeastward to the mouth of the St. Lawrence, with cloudy or rainy weather from Cape Breton to Lake Ontario, and snow in the Province of Ontario. During this day a secondary depression remained over the South Atlantic States, with cloudy and rainy weather. 2nd, clearing weather and south-westerly winds in the Canadian Maritime Provinces, reaching a velocity of 35 miles at Father Point.

No. II.—was probably central over British Columbia on the 1st; light rains fell in Wash. Ty. and Oregon. 2nd, central over Montana; barometer at 4.35 p. m. at Virginia City, 29.19, or 0.39 below normal; high westerly and northwesterly winds and gales accompanied the rising pressure along the western slope of the Rocky Mountains from the interior of Washington Territory to Utah, and brisk to high southerly winds and gales, with falling pressure, along the eastern slope from Kansas to Minnesota and Dakota. 3rd, moved southeastward to the Upper Mississippi valley; cloudy and rainy weather extended to the Ohio valley and Lower Lakes; winds veered to brisk and high northerly along the eastern slope; Cheyenne, N.W. 43; Ft. Stevenson, W. 50; a light thunderstorm occurred at midnight in central Texas. 4th, centre moved to Lake Michigan, where the winds increased to high westerly; cloudy and rainy weather extended to the interior of the Gulf States and Atlantic coast from North Carolina to Maine; clearing weather during latter part of day from the Ohio valley and Lake Erie westward, with brisk and occasionally high westerly winds. 5th, centre moved to the St. Lawrence valley; rain extended over the Canadian Maritime Provinces and clearing weather, with brisk westerly winds, prevailed in the Lake region, except continued snow or rain in northern Michigan. 6th, central over Maine, with diminished energy and fine weather, except fogs or light rains along the Canadian coasts, St. Lawrence and Richelieu or Sorel valleys. 7th, moved northeastward over the Gulf of St. Lawrence, with heavy rain, followed by clear weather, in New Brunswick. Cautionary Signals ordered on the 3rd at Duluth, Escanaba, Milwaukee and Grand Haven, and on the Atlantic coast from Smithville to Sandy Hook, and on the morning of the 4th from Alpena to Buffalo were very generally justified, except on the New Jersey coast. The following maximum velocities were registered: Duluth, N. 32 miles per hour; Milwaukee, W. 40; Grand Haven, W. 36; Erie, W. 30; Wilmington, S.W. 27, and Kittyhawk, S.W. 32. Cautionary Off-shore Signals ordered up at midnight of the 5th, were not justified.

No. III.—developed over Texas on the 4th, and on the 5th and 6th moved down the Rio Grande valley, with fine weather near the centre, but with heavy thunder and hail storms in the West Gulf States. Cautionary Off-shore Signals ordered at Indianola and Galveston on the afternoon of the 5th were justified:—Indianola, N. 34; Galveston, N. 42; Concho, Tex., N.E. 40 miles.

No. IV.—After the passage eastward of high area No. II on the 3rd, fresh to brisk southerly winds, with rising temperature and falling barometer, prevailed over the Western Plateau until the morning of the 6th, when the pressure reached 29.67 or 0.35 below the normal at Olympia, Or.; during the day the centre moved eastward to Montana, followed by a westerly gale, hail and rain in the Columbia valley. 7th, it passed northward into British America. Maximum velocities: Red Bluff, S.E. 40; Umatilla, W. 48.

No. V.—The preceding area was followed over the Pacific States and Western Plateau by high area No. III. On the afternoon of the 9th the pressure was below normal from Nevada to Montana, with westerly winds, to Dakota and Kansas, over which latter region south to east winds prevailed. 10th, lowest pressures over Utah and Nebraska with light rains in Montana. 11th, lowest pressure central over Nebraska, with brisk to high southerly winds and fine weather from Texas to Kansas and Iowa; Fort Sill, S.E. 39; northeasterly winds and rain from northern Michigan to Dakota, and, during latter part of day, brisk to high northerly winds and gales, with heavy rains, from southern Dakota to Colorado; Denver, N. 60; Fort Craig, N. M., W. 42. 12th, central over Nebraska and Kansas; the general condition remained about the same as the preceding day, except that the northerly winds extended to the interior of Texas and the weather cleared from Dakota to Colorado; on this day the maximum wind velocity of the month, N.E. 108 miles, occurred on the summit of Pike's Peak during a blinding snow storm—this is the highest velocity registered since opening of the station, the next below (102 miles) occurred in December 1875; North Platte, N. 60. 13th, central over Iowa and Missouri; light rains or thunder showers extended to the interior of the Gulf States, Ohio valley and Lake Erie, and northerly winds with heavy local rains to northern Missouri. 14th, central depression formed an elongated trough from Missouri to Lake Ontario; cloudy or rainy weather, with northerly winds, from Missouri and Iowa to Ontario, and with easterly winds over eastern Tennessee and northern Georgia. Cautionary Signals ordered for the Lower Lakes on the morning of this day were not justified. 15th, depression divided into two centres, the northern one remaining over Lake Ontario and the southern one moving toward the Gulf States; thunderstorms from Indiana to Tennessee and interior of North Carolina; continued rain in the Lower Lake region and light rains in the Atlantic States by night. From the 16th to the 19th the lowest pressure remained south of the Ohio valley with a gradual tendency toward the northeast along the western slope of the Alleghanies; on the afternoon of the 17th a heavy thunderstorm prevailed from Georgia to North Carolina, and on the 18th and 19th heavy rains along the immediate coast from North Carolina to Long Island and in Maryland; otherwise it was only attended by ordinary rains, and on the 19th was dissipated while central over West Virginia. The northern depression

over the Lower Lakes moved down the St. Lawrence valley on the 16th, with southerly winds and light rains over New England and Middle Atlantic States; a heavy thunderstorm occurred over Maryland; Wood's Holl, SE. 40.

No. VI.—The pressure fell over northern California and Oregon on the 13th, as high area No. IV moved into Montana, and cloudy and rainy weather, with brisk winds, extended to Idaho. 14th, lowest pressure moved into Montana, brisk west to south winds and clearing weather in northern California, Nevada and Utah, but continued light rains in the Columbia and Snake river valleys. 15th, moved towards Manitoba; brisk to high westerly winds at Umatilla, Or., and in Montana, and brisk to high southerly winds from Kansas to Dakota. 16th, disappeared to the north of Lake Superior.

No. VII.—In rear of the preceding area, high area No. V moved northeastward over the Pacific States. 16th, the pressure fell below the normal over northern California, Oregon and Nevada. 17th, depression moved northward, with rain along the coast, and cloudy or threatening weather, with fresh to brisk winds, over the Western Plateau and in western Montana accompanying the formation of a secondary depression, described as area No. VIII, over southern Idaho and northern Utah. 18th and 19th, the lowest pressure probably passed to the northward, but cloudy or partly cloudy weather, with numerous rains and fresh to brisk winds continued during these days over the Pacific States and Western Plateau.

No. VIII—developed on the afternoon of the 17th as stated above. 18th, was central over Wyoming preceded by south to east winds and light rains (increasing to heavy in northern Dakota) in the Missouri valley and Black Hill region. 19th, depression divided into two centres, the northern one moving to Lake Superior, with fresh to brisk winds, partly cloudy weather and light rains in the Northwest; the southern one, moving southward over the Eastern Slope, will be considered as area No. IX; a heavy thunderstorm occurred at North Platte from 8:15 to 9:30 p. m. 20th, moved eastward north of the Lake region, with clear or fair weather, followed by brisk westerly winds in that district. 21st, it passed rapidly eastward over the Gulf of St. Lawrence, with light rains and brisk winds thence to New England. Cautionary Signals ordered up on the Upper Lakes at midnight of the 19th; on the Lower Lakes and along the east coast of New England on the afternoon of the 20th; from Newport to Baltimore on the morning and thence to Smithville on the afternoon of the 21st were justified, except on the Lower Lakes from Erie to Oswego and along the New England coast at Eastport and Portland. Signals were changed to Off-shore on the afternoon and midnight of the 21st from Eastport to Baltimore, in advance of high area No. VI, and were justified along the New Jersey coast. Maximum velocities: Escanaba, N. 29 miles; Port Huron, N. 32; Sandusky, N. 35; Wood's Holl, W. 26; Sandy Hook, NE. 30; Norfolk, NW. 34, and Cape Hatteras and Macon, NE. 36.

No. IX—was an ill-defined depression, which separated from the preceding area and moved southward to the Gulf of Mexico during the 20th and 21st; it was accompanied over the Southwest by the highest temperatures of the month: Concho and McKavett, 107°, Uvalde and Castroville, 108°, and Brackettville, 109°. Cautionary Signals were ordered at Indianola (late) and Galveston on the afternoon of the 20th, but were not justified. Maximum velocities: Indianola, (before signal), S. 28; New Orleans, afternoon of the 22nd, E. 30.

No. X—began to develop slowly over the Sacramento valley and northern Nevada during the night of the 20th. 21st, moved slowly eastward to southern Idaho, with brisk to high winds and occasional light rains. Terrific and destructive hail-storms occurred during the afternoon at Salem and near Sandy, Oregon; at Salem it "commenced about 6 p. m., lasted over thirty minutes, hail fell to a depth of two inches, all skylights were demolished; it was not accompanied by high winds and was apparently confined to a narrow belt." The storm between Sandy and Mount Tabor lasted about the same time, "covered the road to the depth of nine inches with hail-stones, and must have done great damage to orchards." Pioche, S. 38; Salt Lake City, 4:35 p. m., barometer 29.68, or 0.20 below normal, SE. 17 miles, threatening. 22nd, over Montana, preceded by brisk to high southeast winds and thunder-storms in the Upper Missouri and Red River of the North valleys. 23rd, over Dakota and Minnesota, with local rains and brisk to high winds. 24th, over Upper Lakes, with brisk to high winds. 25th and 26th, over Lower Canada. Cautionary Signals ordered for the Lake region, at Duluth, on the midnight of the 22nd, from Marquette to Sandusky afternoon of the 23rd, and thence to Buffalo afternoon of the 24th were only justified on Lake Michigan during passage of present area: Grand Haven, SW. 28 and Milwaukee, SW. 30; but were subsequently justified by high winds attending area No. XI. Cautionary Signals ordered on the afternoon of the 25th from Macon, N. C., to Boston, and at midnight at Portland, changed to Off-shore morning of the 26th on coast of New England, were justified, except at Norfolk and Cape Henry. Maximum velocities: Cape Lookout, SW. 32; Cape May, NW. 28; Sandy Hook, SE. 32; Boston, NW. 28.

No. XI—developed over Kansas and Nebraska on the 23rd and 24th, in southwest quadrant of preceding area. 25th, central over Iowa, followed by gale at North Platte, NW. 60 miles. 26th, central over Illinois; on these days high area No. VIII moved southeastward over the Lake region; this produced a steep barometric gradient, with a large range of temperature and heavy rains or thunder-showers, from Wisconsin to Indiana; during the latter part of the 26th, the pressure increased and storm diminished in energy. 27th, passed northeast over the Lower Lake region with light rains thence to New England. Cautionary Signals ordered on the Lakes in advance of preceding area were continued and fully justified. Maximum

velocities: Duluth, NE. 34; Escanaba, N. 33; Milwaukee, NE. 34; Port Huron, N. 30; Sandusky, E. 36 and Oswego, NE. 28.

No. XII—appeared on the coast of Oregon on the afternoon of the 25th in rear of high area No. VII; 4:35 p. m., barometer at Roseburg 29.80 or 0.24 below normal and at 11 p. m. light rain had commenced falling. 26th, lowest pressure over Wash. Ty.; Olympia, 4:35 p. m., 29.67 or 0.34 below normal, after which centre passed northward, clearing weather by night at Roseburg, increasing rain at Portland and Olympia. 27th, southerly winds, with rain continued during the early morning at Portland and Olympia, but changed to northerly with temporary clearing weather as the following depression developed to the southward.

No. XIII—developed over northern California and southern Oregon on the 27th; cloudy, threatening and rainy weather from the coast to Utah; thunder-storm at Winnemucca, Nev. On this day a depression began to develop in the Missouri valley, which will be considered as area No. XIV, as the present area disappeared, probably to the northward, and high area No. X appeared on the coast of California.

No. XIV.—27th, falling pressure in the Missouri valley. 28th, central over southern Dakota; 11 p. m., lowest pressure, 29.56, or 0.38 below normal, at Bismarck; southeast to northeast winds and light rain from Wisconsin to Dakota; brisk to high southerly winds and high temperatures southward. 29th, central over Minnesota, with increasing rains and thunder-showers, with hail, at places southward to Missouri, and followed by colder northwest winds southward to Nebraska. 30th, it moved east northeastward over Canada; high temperatures prevailed throughout the Gulf and Atlantic States, and in Ontario, Can., several cases of sunstroke were reported. Cautionary Signals ordered for Lakes Superior and Michigan on the 28th, on Lakes Huron and Erie afternoon of the 29th, and Lake Ontario afternoon of the 30th were justified, except at Duluth, Buffalo, Rochester and Oswego. Maximum velocities, Marquette, SW. 36; Milwaukee, W. 40; Alpena, SW. 31; Port Huron, SW. 33; Sandusky, SW. 36; Cleveland, S. 36; Columbus, O., S. 36.

No. XV—developed during latter part of 29th and morning of the 30th over the high lands of north-western Texas. 30th, 4:35 p. m., (Washington time) brisk southerly winds over Texas increasing to high over Indian Territory, with a general temperature of from 90° to 100°; easterly winds and threatening weather in the Lower Missouri valley; northerly winds over western Nebraska and Kansas, increasing to NW. 44 miles at Dodge City, and of a temperature ranging from 60° to 72°. Snow fell on the mountains around Denver and Santa Fe, and by morning of the 31st the thermometer fell to 10° on summit of Pike's Peak. From 4 to 10 p. m. several tornadoes swept over portions of eastern Kansas, southeastern Nebraska and northern and western Missouri, brief notice of which will be found under the head of *Local Storms*. The general direction of these tornadoes appears to have been uniformly northeastward, corresponding with that of the centre of depression. Along the immediate northern margin of this track very heavy rain fell during the night of the 30th. 31st, centre of depression increased in area with rising pressure and decreasing energy, and by 4:35 p. m. formed an elongated trough extending from Arkansas and Missouri to southern Michigan, attended by cool and brisk northerly winds over the Upper Lakes, Northwest and Eastern slope and by southerly winds from the Ohio valley and Lower Lakes south and eastward. Throughout the day cloudy and rainy weather, with occasional heavy thunder-storms, prevailed from the Southwest to Tennessee, the Lake region and Iowa. Cautionary Signals ordered up in advance of preceding area were continued. Maximum velocities, Detroit, S. 36; Dodge City, NW. 56; Cautionary Signals ordered for Indianola and Galveston on the afternoon of the 29th were justified; Indianola, midnight of 31st, NE. 39.

INTERNATIONAL METEOROLOGY.

The extra chart distributed with the present *Monthly Review*, is based on the daily charts published with the *Bulletin of International Simultaneous Observations for October, 1877*. It has been prepared in accordance with special instructions from the Chief Signal Officer, and shows the average pressure at sea level, the temperature and prevailing winds for October, 1877, at 7:35 a. m., Washington time as given by the simultaneous observations reported to this Office.

On chart No. IV are shown the probable tracks of storm-centres over the oceans, deduced from data received at this office up to June 2nd, and in the upper right-hand corner will be found an index to the same. In the upper left-hand corner is a small table giving the approximate wind direction and probable maximum velocities (in miles per hour and meters per second) attending the depressions on the dates named. The following is a brief notice of the same, and also of some storms over the Southern Hemisphere:

North Atlantic Ocean.—No. I is a continuation of area of low barometer No. IV of the *April Review*; it passed over Newfoundland during the latter part of the 4th; on the 5th, strong SW. gales (veering on the 6th to NW.) and very high seas were experienced about 46° N., 40° W.; 6th, SW. and NW. strong gales and high seas extended eastward to 30° W., and rapidly falling pressure was reported on the coast of Ireland; on the 7th, this depression probably joined area No. X of the *April Review*. No. II appeared on the 7th to the southeast of Newfoundland, and during the night developed into a very severe storm, with winds of hurricane force, about 45° N., 40° W. No. III is a continuation of low area No. VI of the *April Review*; it passed eastward north of Newfoundland on the 9th and 10th, and probably followed the